Governor's Task Force on Science, Technology, Engineering and Math Education (STEM)

Tuesday, May 6, 2014

Deka Research Corporation, Manchester, NH

Task Force Members in Attendance:	Ross Gittell, Chairman; Brian Blake; Barbara Couch; Susan D'Agostino; Mary Kate Hartwell; Joseph Helble; Caroline Herold; Jeremy Hitchcock; Robert Hollowell; Dean Kamen; Todd Lamarque; Paul Leather; Palligarnai Vasudevan.
Absent:	Joyce Craig
Governor's Office:	Molly Connors, Policy Advisor to Governor Maggie Hassan
Others present:	Don Mose, Executive Director of USFIRST; Kathleen McClaskey, Advocacy Chair, NH Society for Techology in Education

I. Call to order

Chairman Gittell opened the meeting at 4:00 pm by welcoming members of the Task Force and the public who were present at the meeting. He asked all present to introduce themselves.

II. Approval of April 17, 2014 minutes

Robert Hallowell made a motion to accept the minutes. Barbara Couch seconded. The minutes were approved unanimously.

III. Recommended Task Force Activities

Chairman Gittell asked the Task Force members to review guiding questions compiled from April 17, 2014 Task Force meeting (see attachment). Each Task Force member was asked to respond to the list and where appropriate to offer suggestions with examples and/or suggested resources to be considered.

Action: Three study groups (A-C) were formed to develop actionable and measurable recommendations for the guiding questions listed below, and to prepare progress report for next Task Force meeting.

A. **How can we get students excited about STEM?** Members: Barbara Couch, Susan D'Agostino, Joseph Helble, Robert Hollowell and Dean Kamen

B. **How do we empower educators?** Caroline Herold, Ross Gittell and Todd Lamarque

C. **What standards/requirements should be in place?** Brian Blake, Mary Kate Hartwell, Jeremy Hitchcock, Paul Leather, and Palligarnai Vasudevan

Discussion highlights of guiding questions are as follows:

A. How can we get students excited about STEM?

- **Create STEM as shared experience for all students**. The Task Force expressed concern that STEM studies and experiences would not be limited by time or circumstances such as after school and out-of-school programs since all students may not be able to participate if beyond the school day. Distance or access to key STEM programs needs to be considered

- Develop age appropriate STEM programs that relate to student cognitive development.

- Offer STEM studies at every grade level to build continuity and pathways to ensure STEM learning and engagement is sustained and builds from each grade level to the next.

- Create career pathways including opportunities for students to interact with professionals in STEM-related careers

- Create collaborations and partnerships with local school boards, parents, community and business/industry.

  Create scholarships for students who pursue STEM majors, and offer college tuition/loan forgiveness for teacher prep in STEM fields.
- Explore opportunities to involve students in STEM summer camps, bridge programs, Career and Technical college studies, and competitions

B. **How do we empower educators?** What headwinds do educators face and how can these be overcome?
  - Create internships for teachers at STEM companies
  - Develop partnerships with local universities and colleges to offer educational seminars on STEM for professional development continuing education credits
  - Foster opportunities for parents to interact with teachers in STEM workshops and through other resources
  - Explore online learning and other resources for STEM teachers
  - Expand STEM training to include guidance counselors, principals and other non-STEM teacher-leaders
  - Develop compensations to reduce loss of STEM-educated teachers to business and industry

C. **What standards/requirements should be in place?**

The Task Force suggested that math and science requirements for high school graduation be reviewed as they may need to be updated to meet current career and college entry requirements. In addition, New Hampshire will be replacing the NECAP testing with Smarter Balanced (SBAC) assessments in 2015. The impact of these new assessment standards need to be examined in the context of New Hampshire Common Core standards as

well as implications for the NH state science assessment. Note: NH is a member of the NECAP Science Consortium with RI, VT, and ME. These three other States have adopted the Next Generation Science Standards (NGSS) and the assessments in these states will then reflect NGSS standards after 2016, while NH currently does not have a plan for science assessment beyond 2016.

D. **How should we measure progress and ensure accountability (for the above)?** What are best scorecards and measurement practices in US states, internationally?

The Task Force identified four overarching goals for its work

- Student engagement is essential
- Create opportunities for STEM involvement within or linked to the school
- Put standards in place to ensure appropriate rigor and focus for educational and career, technical and marketplace needs in 21st century.
- Frame STEM activities within a "big" picture goal to energize support by NH citizens

E. **Who should we partner with and review research/resources from**?
The following STEM-related resources were suggested and will be posted on Task Force website hosted by CCSNH (see item IV below)

- **Engineeristas :**A one-week camp experience for girls entering grades 6 & 7
- **EPIC – Summer Computer Camp** : UNH's **EPIC** (Elementary Program Introducing Computing)
- **Tech Camp:** Tech Camp is a two-week co-ed program for first time campers entering Grades 6 – 8 to explore electrical, mechanical, aerospace, biomedical, and naval engineering along with robotics and computer technology.
- tech education-CAD programs such as those at Bedford elementary school
- **USFirst programs** which offer range of STEM-inspired programs from junior legos and technology challenges to robotics competitions
- **Parent fairs and tours** at technology companies including Hypertherm, DEKAresearch and Dyn Corporation
- **STEM Discovery Labs** for K-12 students to do hands on learning
- Regional education centers in NH
- Resources outside NH: Iowa and Wisconsin STEM programs

IV. Other

- Website for Task Force resources

  Chairman Gittell reported that CCSNH is creating a website for the Task which will include useful resources and opportunities for public feedback. The website is in progress and completion date will be announced shortly.

- Meeting Schedule

  The next Task Force meeting is May 27, 2014, 4-6 PM at Dyn Corporation, 150 Dow St, Manchester, NH 03101

- Meeting was adjourned at 6:00 pm

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ADDENDUUM FOR ITEM III

Below are the areas of focus with ideas to be considered, as identified in the April 17, 2014 initial Task Force meeting, For each of the below (A-C) topic areas each task force member should be prepared to discuss one or two recommendations (from the list or not) with examples and/or suggested resources.

A. How can we get students excited about STEM? What has been effective in NH, in other states, internationally? If we have an idea of what works, how can we scale it?

- Competitions, e.g., FIRST
- Exposure/Visits to STEM industry in NH
- STEM summer camps and bridge programs
- CTE-CC career academies
- Career pathways promotion and support
- Public campaigns
- Partnerships with industries on all the above…

B. How do we empower educators? What headwinds do educators face and how can these be overcome?

- STEM resources clearinghouse, with links to mentors, industry partners, educational resources, best practices
- Teacher internships at STEM companies
- Sabbaticals for teachers for them to enhance STEM learning and pedagogy
- Parent STEM education workshops and resources
- Online STEM learning and resource modules, programs and courses for teachers (these could be created by colleges and industry in NH)
- Support cognitive development understanding and the implementation of school activities that match student biological development
- Guidance counselor training in STEM

C. What standards/requirements should be in place? (see recent NH STEM Inventory report)

- Science, K-8, exposure, hands on experience, integrated learning
- Math, high school requirement
- Computer Science, as high school requirement
- Experiential learning

- Internship, co-ops programs
- Engineering, "capstone" project in middle and then in high school
- Education-to-Career Pathway mapping, required for all students in 7th and 10th grade

D. How should we measure progress and ensure accountability (for the above)? What are best scorecards and measurement practices in US states, internationally?

- What are the overall goal(s) and objectives, e.g., STEM literacy for all HS graduates, a benchmark percentage of NH HS graduates on STEM career pathways?
- What types of STEM scorecards --for each school, city/town, and county, state-wide -- should be used?

E. Who should we partner with and review research/resources from?

- DoE, USNH, CCSNH, Private Educational Institutions
- NHCF
- NSF, National Academy of Sciences, US DoE
- Others

F. Discussion of Next Steps. Open discussion.

- Should we have Task Force members each pick 2-3 of the bullets in A-C to work on with other task force members and then present to full Task Force for further refinement in subsequent meetings?